Claims

What is claimed is:

1. A tracking system comprised in a receiver, which tracking system is operable to track rapid changes in frequency and phase offset, wherein said tracking system comprises a first system operable to perform a pilot-based phase and frequency tracking, wherein said tracking system also comprises a second system operable to perform data-based phase and frequency tracking, and a control system connected to said first system and to said second system that is operable to gradually reduce an effect of said first system.

2. A tracking system according to claim 1, wherein said control system comprises at least one weighting component operable to gradually decrease weight factors associated therewith to gradually reduce said effect of said first system.

3. A tracking system according to claim 2, wherein said control system also comprises a first estimating component operable to perform an estimate of the phase of the received symbol, and a phase differentiator connected to said first estimating component that is operable to calculate the phase increment between two consecutive symbols, and a first weighting component connected to said phase differentiator, and a frequency scaling component connected to said first weighting component that is operable to scale the weighted value to obtain a frequency correction increment output.

4. A tracking system according to claim 3, wherein said control system also comprises a second weighting component connected to said phase differentiator that is operable to multiply said phase increment with a weight factor, and a phase integrator connected to said second weighting component that is operable to sum together all of said individual phase increments to obtain a phase error estimate output.

5. A tracking system according to claim 4, wherein said control system also comprises a symbol counter component connected to said first weighting component and to said second weighting component that is operable to count the symbols in order to use a weight factor that depends on the symbol number.

6. A tracking system according to claim 5, wherein said system comprises a frequency correction component operable to correct a frequency error of a received symbol, a transforming component connected to said frequency correction component that is operable to perform a Fourier transform operation resulting in a number of independently modulated subcarriers, wherein said transforming component is connected to said first estimating component and said frequency scaling component is connected to said frequency correction component, wherein said tracking system also comprises a phase correction component operable to perform a correction of the symbol phase, which phase correction component also is connected to said phase integrator, a demodulating component connected to said phase correction component that is operable to demodulate said phase-corrected symbol to produce a data stream, a remodulating compo-

nent connected to said demodulating component that is operable to remodulate said data stream, a frequency estimation component connected to said remodulating component, and an error correction component connected to said demodulating component resulting in said final estimate of the received data symbols.

7. A tracking system according to claim 6, wherein said weight factors are set to 1 up to where a transition from a pilot-based phase and frequency tracking to a data-based phase and frequency tracking is to occur.

8. A tracking system according to claim 7, wherein said weight factors for the same symbol number are equal for said first weighting component and for said second weighting component.

9. A tracking system according to claim 7, wherein said weight factors for the same symbol number are unequal for said first weighting component and for said second weighting component.

10. A method for tracking rapid changes in frequency and phase offset in a receiver, which method comprises:

performing a pilot-based phase and frequency tracking;

performing data-based phase and frequency tracking; and

gradually reducing an effect of said pilot-based phase and frequency tracking.

11. A method for tracking rapid changes in frequency and phase offset in a receiver according to claim 10, wherein said method also comprises:

employing gradually decreasing weight factors in order to gradually reduce the effect of said pilot-based phase and frequency tracking.

12. A method for tracking rapid changes in frequency and phase offset in a receiver according to claim 11, wherein said method also comprises:

performing an estimate of the phase of the received symbol;

calculating a phase increment between two consecutive symbols;

weighting said phase increment with a first weight factor; and

scaling said weighted value to obtain a frequency correction increment output.

13. A method for tracking rapid changes in frequency and phase offset in a receiver according to claim 12, wherein said method also comprises:

weighting said phase increment with a second weight factor; and

summing together all of said individual phase increments to obtain a phase error estimate output.

14. A method for tracking rapid changes in frequency and phase offset in a receiver according to claim 13, wherein said method also comprises:

counting the symbols in order to use a weight factor that depends on the symbol number.

15. A method for tracking rapid changes in frequency and phase offset in a receiver according to claim 14, wherein said method also comprises:

correcting a frequency error of a received symbol;

performing a Fourier transform operation resulting in a number of independently modulated subcarriers;

performing a correction of the symbol phase;

demodulating said phase-corrected symbol to produce a data stream;

remodulating said data stream; and

performing an error correction resulting in a final estimate of the received data symbols.

16. A method for tracking rapid changes in frequency and phase offset in a receiver according to claim 15, wherein said weight factors are set to 1 up to where the transition from pilot-based phase and frequency tracking to data-based phase and frequency tracking is to occur.

17. A method for tracking rapid changes in frequency and phase offset in a receiver according to claim 16, wherein said first weight factor and said second weight factor for the same symbol number are equal.

18. A method for tracking rapid changes in frequency and phase offset in a receiver according to claim 16, wherein said first weight factor and said second weight factor for the same symbol number are unequal.

19. At least one computer program product directly loadable into the internal memory of at least one digital computer, comprising software code portions for performing the method of Claim 10 when said at least one product is run on said at least one computer.